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(54) Method and device for program distribution

(57) The present invention relates to a method and device for transmission of program in a transport network/telecommunication network. The information is provided by a number of distributors which are connected to a transport network via channel creating devices. The channel creating devices receive information from control devices which allocate a number of different time slots to the distributors. The information which is transmitted digitally in the transport network is after that received by channel creating devices to which subscribers are connected. The information is transformed in the channel creating devices to for the subscribers receivable information. Information regarding which channels that are utilized for respective subscribers and respective programs is transmitted by the control device to the channel creating devices of the subscribers. The invention allows that a subscriber identifies a program he/she wants to watch from an appointed distributor, from which the program after that is transmitted to the subscriber at by the subscriber wanted point of time. Program information is only transmitted for the programs to which there are interested parties in the network.

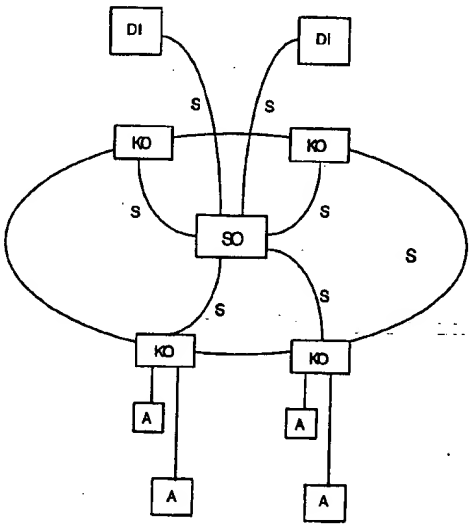

Figure 1

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Description

TECHNICAL FIELD

The present invention relates to distribution of programs over a network. To the network a number of program distributors are connected which provide programs to subscribers. The transmission of programs can be made individually or in broadcast function.

PRIOR ART

Distribution of programs is known in a number of different variants. In the ether, for instance programs from different program distributors are transmitted to the receivers. In this case in advance appointed frequencies are used for the transmission. The transmission is made at fixed points of time, and the program distributor controls completely which programs that shall be transmitted and when. The receivers receive the information in question at the points of time the distributor dictates. Possibility for the subscriber to watch or listen to current programs at other points of time can be arranged by the subscriber utilizing devices which can receive and store the programs in question to be played back later. To utilize different tape recorders is for instance known for reception of radio and TV- programs.

It is further known to transmit programs over cable networks. In these cases the information is transmitted by the distributor in the cable network and received by subscribers. The program supplier also in this case directs the offer to certain times. The subscribers also in this case have to adapt themselves to the program distributor's discretion. A certain freedom to watch or listen to the program at different points of time however exists with the program distributor in this case possibly transmitting the programs repeated at different points of time. Consequently it is previously known to transmit for instance radio and TV-programs via land-based radio stations.

Further, radio and TV-programs are transmitted in the ether via different satellite stations. Further it is known to transmit programs in land-based networks which are provided by a distributor and to which a number of receivers are connected. The in the ether transmitted programs are restricted by the room for frequencies in the ether. In the wirebased networks which are utilized at present, it is mostly one distributor that provides information. The to the receivers transmitted information reaches all subscribers. To the extent that certain subscribers shall not have access to certain programs, an encoding of the programs is made. The subscribers shall at that have access to equipment which decodes the information to one in the receving device receivable information.

In patent document EP 633694 is described a system to distribute video programs. The method makes use of just any network to distribute programs in the form of packets. The channels are divided in such a way that video packets can be transmitted to the subscriber with large bandwidth and a certain bandwidth is reserved for communication of control signals from the subscriber to "video-on-demand"-systems. To the suggested system just any number of "VOD"-services can be connected.

In patent document EP 625858 a server is described, intended to be utilized in a "video-on-demand" (VOD). The program information is transmitted to the subscriber in the form of time blocks which consist of less than one second of video information.

In patent document EP 594350 an interactive telecommunication system is described. According to the document the information to different subscribers can be tailored by dividing and transmitting the information in the form of time segment. The receiver receives and decodes the packets which is intended for him/her.

In patent document US 4994909 a way to distribute programs from a central unit to a subscriber is described. The program information is multiplexed at the central unit and is transmitted in blocks of four programs to him/her.

In patent document US 4573072 is described a way to distribute the selection possibilities a telecommunication system can offer in form of "displayable choices". This is achieved by multiplexing the information in time and frequency.

DESCRIPTION OF THE INVENTION

TECHNICAL PROBLEM

Program distribution shall be possible to perform in a more flexible way than what is utilized today. Consequently, the subscriber should have possibility to chose which program he/she wants to watch or listen to. Further, there exists a need to utilize existing distribution networks in a more effective way. Programs which are not listened to/watched, should not be in the distribution channel. Moreover the subscribers should have possibility to decide themselves which programs and which distributor he/she wants to utilize.

Wishes exist to have possibility to transmit a number of programs from a number of distributors in one and the same network to a number of receivers. The in the network transmitted information shall on the one hand be identifiable with regard to program, and on the other hand be identifiable with regard to distributor. The in the network transmitted information shall be adaptable to the capacity of the network. Capacity which is not utilized by one distributor shall be possible to utilize by another distributor. The receiver further shall have possibility to select information from one or more distributors. Programs which the receiver has selected to have possibility to receive, shall be possible to receive in one or more reception devices. In the cases a number of reception devices are utilized, different programs shall be possible to receive in respective reception device. A

second wish is that existing networks, such as for instance telecommunication networks in different countries, shall be possible to utilize for program distribution. The present invention has the intention to solve above related problems.

THE SOLUTION

The present invention relates to method at program distribution. Subscribers and distributors are connected to a transport network via channel allocation devices. The distributors transmit information to the transport network via the channel creating devices which divide the distributor's information in time slots. The channel creating devices which are connected to the subscribers, identify time slots in question and transform the information in these to for the subscriber interpretable information. The subscriber selects wanted distributor and wanted program.

In a further development of the invention a distributor is allocated one or more time slots. At least one time slot is allocated each program. Control devices in the system allocate necessary time slots for the programs to the distributors.

The program offer of the distributors are presented to the subscribers who select a distributor and wanted program. The control device allocates time slot/slots for the program transmission in question. The subscriber is in this way given possibility to watch/listen to the program at a point of time which the subscriber decides. The distributors only transmit programs which the subscribers at each moment require and watch/listen to. The subscribers communicate with the distributors for identification of wanted programs. The control device allocates and identifies which time slots that shall be utilized. The channel allocation devices are informed about which time slots that are utilized in the program transmission in question.

The present invention further relates to a device at telecommunication networks for distribution of programs. To the telecommunication network, channel creating devices are connected. Connection of program distributor and receivers to the network is made via channel allocation devices. The programs are transmitted from the program distributors via the channel creating devices to the telecommunication network. Channel creating devices in connection to the receivers identify wanted channel/channels and wanted distributor/distributors. The channel creating devices transform the in time slots divided information in the network to for the receivers receivable information. The information is after that transmitted to the receivers on different radio frequencies, channels, which allow that different programs are received on one and the same occasion at different receiving devices at one and the same receiver.

The telecommunication network is at least partly ring-shaped. The programs are allocated time slots in the telecommunication network, which correspond to the program information in question. Preferably one channel/time slot is allocated for each program. The sizes of the time slots are varied depending on the channel need for the program in question. The receivers further decide which program/programs that are received, and from which program distributor/distributors the programs shall be received. Control device/devices are further arranged in the telecommunication network. The control devices receive information from the program distributors regarding the current program offer. The information is transmitted from the control device to the channel creating devices for identification of the time slots in which information shall be transmitted to the telecommunication network or be extracted from the telecommunication network. The receivers only have access to the in advance appointed programs from respective program distributor. Information regarding the selection is stored at the control devices which are arranged to inform the channel creating devices, which are arranged to select time slots in question and transform one from these received information to for the receivers receivable information. The information to the receivers are preferably transformed to frequencies/channels which can be received at for instance radio and/or TV-receivers. Transmission is in itself also possible to perform digitally to receiving equipments which are arranged to receive this type of information. In this case the channel creating devices transform the information to for the receivers receivable digital information.

ADVANTAGES

The present invention has the advantage that the subscribers themselves can decide which distributor and which program/programs he/she wants to watch and listen to. Further, the invention has the advantage that only programs which the subscriber wants to utilize are transmitted into the network. The network can in this way be more effectively used and a number of distributors can at the same time transmit information in the network. Further, program transmission can be made individually to each subscriber.

With the present invention is allowed that a number of distributors can be connected to one and the same network. The receivers here have possibility to select programs which are distributed by one or more distributors. Only the information that shall be received by the receivers in question is extracted from the in the network transmitted information. Accordingly it is not necessary to arrange special encoding equipments or decoders. The invention further allows that transmission of information for program purposes can be made in existing telecommunication networks. Preferably should at that fibre network be utilized. Other networks can, however, be utilized as far as there is capacity.

By the indicated solution the receivers get possibility to at the same time receive a number of programs from one or more distributors on different receiving

equipments which are arranged at the receiver. The reception at that can be made on established channels or frequencies which are normally used by respective receiver.

DESCRIPTION OF FIGURES

Figure 1 shows the construction of the invention in principle.

Figure 2 shows a ring network with a number of distributors and receivers.

DETAILED EMBODIMENT

In the following the invention is described with reference to the figures and the terms therein. In Figure 1 a number of program distributors, DI, are indicated. Further, a number of subscribers, A, are indicated. The distributors and the subscribers are connected to a distribution network, N, via channel creating devices, KO. Further there is a control device, SO, indicated. The control device communicates with the channel creating devices, KO, and the distributors, DI, via signal routes, S. The distributors, DI, provide a number of programs which can be received by the subscribers, A.

In a first aspect of the invention, the distributors provide a program offer which is transmitted in the transport network. The distributors communicate before the transmission with signal creating devices and inform the signal creating device the number of programs and need of channels. The signal device analyses the need for channels from the different distributors. The signal device after that establishes which need for channels that exists, and allocates the channels between the different distributors in a suitable way. After that the channel creating devices in the system are informed about which time slots that are utilized by respective distributors and where respective programs are located. Depending on the size of the program one or more time slots can at that be utilized in ways which are known in connection with transmission of digital information in a network. The invention, however, also allows that the control device can allocate different channels different sizes of range. Also in this case the channel creating devices are informed, which after that arrange the information in the channels that are created. Possibility is at that obtained to utilize the capacity of the transport network in an effective way. The information which is transmitted from the distributor can at that be added directly into the indicated time slots, or be transformed in the channel creating devices to for the network suitable information. The information is after that transmitted in the network and is received by channel creating devices, KO, to which subscribers are connected. A subscriber, A, who wants to watch/listen to a program, at this informs his/her channel creating device about his/her wish. The channel creating device registers the wish and checks with the control device which time slot or time slots that shall be decoded. Depending on the subscriber's wish can at that all information from a distributor be decoded and transmitted towards the subscriber. The information can at that be transmitted digitally or transformed to another form, which can be received by the subscriber. The subscriber at that has possibility to receive all channels from a distributor in a usual way. The subscriber further can chose only to watch one of the programs which are transmitted, at which the channel allocation device is informed in the same way as previously. The channel creating device also in this case receives information from the control device regarding which time slot/slots that shall be extracted and decoded to make the wanted program possible to be transmitted to the subscriber. In the scenario which is now described, information is transmitted to all subscribers in the network from the distributors, but the subscribers decide themselves which distributor that shall be favoured. A number of subscribers accordingly have possibility to receive information from one and the same distributor, or from different distributors.

In a second variant of the invention the distributors continuously transmit program information over the transport network. The control device at this transmits information to the different channel creating devices about which channels that can be referred to respective distributors. When a subscriber wants to receive a program, he/she informs the channel creating device, which informs the subscriber which distributors that exist. The subscriber after that selects one of the distributors and checks in the distributor's program list which programs that exist. The subscriber can at that alternatively look at the program lists of the different distributors. If the subscriber finds a program which is of interest and he/she wants to watch/listen to, he/she informs that to the channel creating device. The channel creating device informs the control device which in its turn informs the distributor. The distributor informs the control device which channel/channels that shall be utilized with regard to the channel need the program requires. The selected channels are informed about to the distributor's channel creating device and to the subscriber's channel creating device. The program is after that transmitted from the distributor to the channel creating device. The channel creating device transforms the from the distributor received information to information which is added to the selected time slot/slots. The information is after that transmitted in the transport network and received by the current subscriber's channel creating device. The subscriber's channel creating device after that extracts the information from the slot in question, and transforms the information to for the subscriber receivable form. The channel creating device controls during the program transmission whether the subscriber is still listening to/watching the program. If the subscriber breaks the reception of the program, the checking device informs the control device, which in its turn informs the distributor, after which the connection in question is disconnected.

The current slot which carries the information in the transport network is after that free to be utilized by other distributors and subscribers. The invention accordingly in this case gives a possibility to the subscribers to individually and at just any point of time watch or listen to a program that the distributor has accessible. The distributor can in this case apply different strategies for transmission of the program. Thus the program can immediately be transmitted to the subscriber in question, whereas other subscribers can, with regard to point of time, watch the same program, but displaced with regard to point of time. In other variants the distributor can decide that the programs shall be transmitted at decided points of time, for instance at every quarter of an hour. At this a number of subscribers who have chosen to watch or listen to a program are connected to the connection in question.

In a network, N, according to Figure 2, a number of channel creating devices, K, are arranged, and receivers, M, connected. In the figure is further indicated that the network can be divided into different parts, where the different parts can be ring-shaped, mesh-shaped etc. In the system is further included control devices, S, which have the task to distribute accessible channels in the network and to distribute said channels in best possible way with regard to the information which at each moment is transmitted in the network. The control device communicates with all channel creating devices in the system.

A program which shall be transmitted from a distributor, D, in the network is transmitted to the channel creating device to which the distributor's equipment is connected. In connection with the initiation of the program transmission, an information is transmitted to the control device, S. The control device at this receives information about the character and size of the program. The control device establishes, on the basis of the received information, which size of channel range that is required. Accordingly, different sizes of channel ranges are required, depending on whether the information that shall be transmitted relates to speech, music, video, speech and video etc. When the control device has established which size of range the program requires, the control device controls the rest of the traffic which at the moment is transmitted in the telecommunication network. The control device after that establishes whether a channel of sufficient size is accessible in the network or not. In the case a sufficiently large channel exists, this is allotted the current connection. If a channel of sufficient size is lacking, is examined whether reorganization of the channels in the network can be performed and at that create channel range of sufficient size. If the control device decides that a reorganization shall be made, the control device decides the new organisation for the channels and informs the different channel creating devices in the system how existing channels shall be redistributed and how the new channel shall be placed in the system. The channel creating devices in the system after that receive information about which time slots in the information transmission that relate to which programs and from which distributors.

The from the distributor transmitted information is after that received in the channel creating device in question. The channel creating device transforms the from the distributor received information to one for the network adapted information. The from the distributor transmitted information can be analog or digital. In the network the information is preferably transmitted digitally. The in the network transmitted information is after that transmitted in the time slot in question. The information is after that transmitted in the network and at that passes a number of channel creating devices.

When the information returns to the channel creating device from which the information was originally transmitted, new information is added to the time slot in question. If all information from the distributor has been transmitted, the time slot in question is released, and no further information is added to it. Reception of the information in question is made via channel creating devices which are connected to the respective receivers. The channel creating devices connected to the receivers identify with regard to the information from the control devices the different time slots that shall be transformed to information that can be received by the receiver. When the from the distributor transmitted information reaches the channel creating device, this identifies the time slot in question and transforms the current information to one for the receiver receivable information. Depending on which type of receiver the receiver has, the information is transformed to different frequencies/ channels which can be received on for instance radio and TV-sets. The information can further be transformed to digital information which can be received by the receivers. In this case is of course assumed that the receivers are arranged for digital information. The digital information that is transmitted in the network, and that which is transmitted from the channel creating device to the receivers, is in this case not necessarily of the same format. Transformation is of course made in the channel creating device. The information which has been received by the channel creating device is forwarded to next channel creating device in the system.

The invention is not restricted to what is described above, or to the patent claims, but can be subject to modifications within the frame of the idea of the invention.

Claims

1. Method at program distribution, where subscribers and distributors have been connected to a transport network via channel allocation devices, and the distributors transmit information to the transport network via the channel creating devices, which arrange the information of the distributors in time

slots, **characterized** in that the channel creating devices define time slots in question for connection to the subscribers and transform the information in the time slots to for the subscriber interpretable information, and that the subscriber selects wanted distributor and wanted program.

2. Method according to patent claim 1, **characterized** in that one or more time slots are allocated a distributor.

3. Method according to any of the previous patent claims, **characterized** in that at least one time slot is allocated each program.

4. Method according to any of the previous patent claims, **characterized** in that control devices allocate the distributors necessary time slots.

5. Method according to any of the previous patent claims, **characterized** in that the program offer from the distributors are presented to the subscribers, and that the subscribers select a distributor and a wanted program, and that the control device allocate time slot/slots at which the subscriber is given possibility to watch/listen to the program at a point of time which the subscriber decides.

6. Method according to any of the previous patent claims, **characterized** in that the distributors only transmit programs which the subscribers at each moment demand and watch/listen to.

7. Method according to any of the previous patent claims, **characterized** in that the subscribers communicate with the distributors for identification of wanted programs, and that the control device on each occasion allocates and identifies which time slots that shall be utilized, and that the channel creating devices are informed about which time slots that are utilized.

8. Method according to any of the previous patent claims, **characterized** in that the channels are flexibly allocated different sizes of ranges depending on the current need with regard to the program structure.

9. Device at telecommunication network for program distribution, to which telecommunication network channel creating devices are connected, and program distributors respective receivers are connected to the telecommunication network via the channel creating devices, and the by the program distributors provided programs are transmitted from the program distributor to channel creating devices to the telecommunication network, and the programs are received by the receivers via the channel creating devices, **characterized** in that the channel creating devices are arranged to divide the programs from the program distributors in time slots, that reception of the programs to the receivers is made by appointing of wanted channel/channels and wanted distributor/ distributors, at which the channel creating devices are arranged to transform the programs to for the receivers receivable information, which information is divided into, for instance, different frequencies which allow that different programs are allowed to be received on one and the same occasion at different receiving devices at the receiver.

10. Device according to patent claim 9, **characterized** in that the telecommunication network at least a part of it is ring-shaped.

11. Device according to patent claim 9, **characterized** in that the programs are allocated time slots in the telecommunication network, corresponding to the current program information.

12. Device according to any of the patent claims 9-11, **characterized** in that a channel/time slot is allocated each program.

13. Device according to patent claim 9, **characterized** in that the receivers decide which program/programs that shall be received and which program distributor/distributors the programs are received from.

14. Device according to any of the patent claims 9-13, **characterized** in that control device/devices is/are arranged in the telecommunication network.

15. Device according to patent claim 14, **characterized** in that in the control devices, information is received from the program distributors regarding the current program offer, and that information is transmitted from the control device to the channel creating devices for identification of time slots in which information shall be supplied to the telecommunication network, or be extracted from the network.

16. Device according to patent claim 13, **characterized** in that the receivers are only allocated access to the in advance appointed programs from respective program distributors, and that information about this is stored at the control devices, which are arranged to select current time slots and transform one from these received information to for the receivers receivable information.

17. Device according to patent claim 16, **characterized** in that the information is transformed to frequencies/channels which can be received at for instance

radio- and/or TV-receivers.

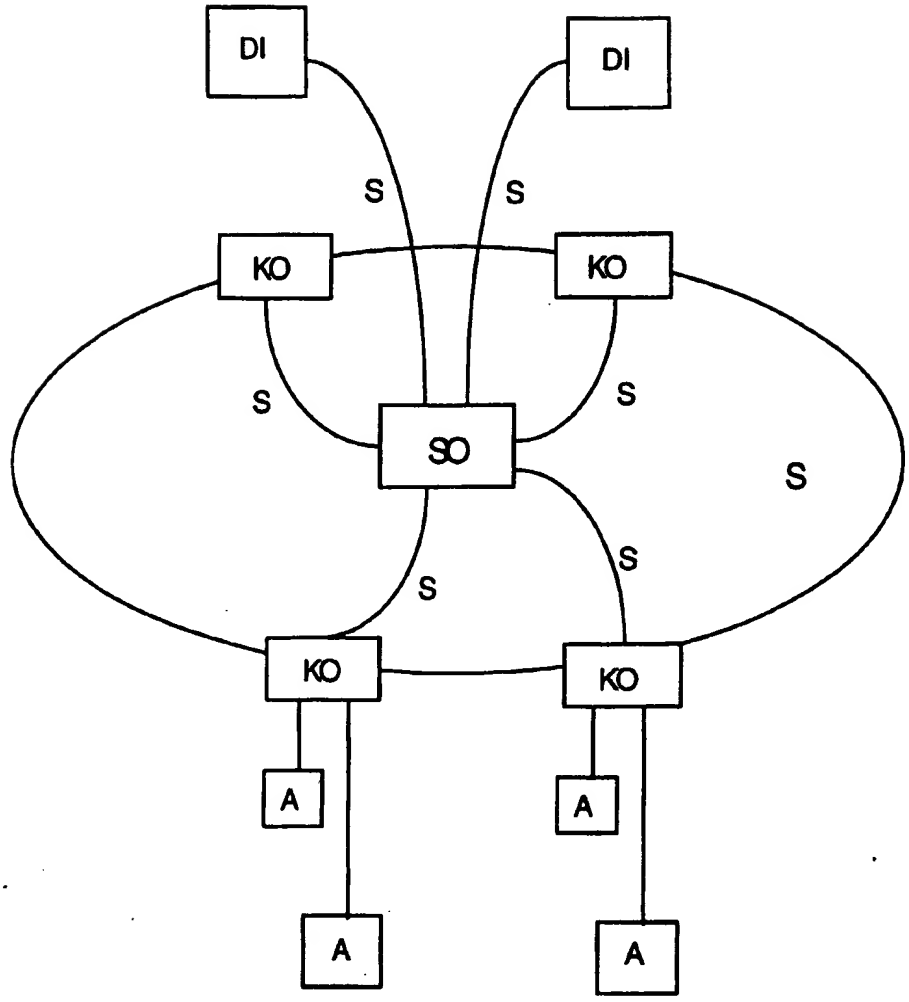

Figure 1

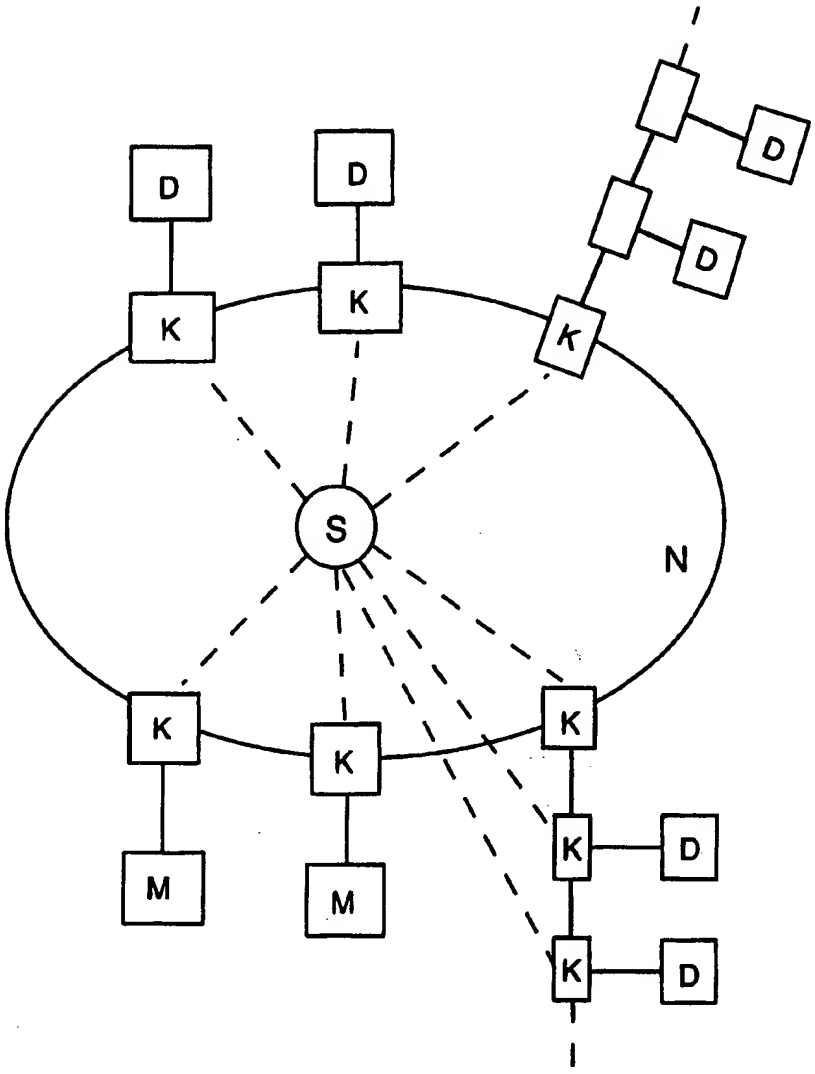

Figure 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 85 0119

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	WO-A-95 13681 (SCIENTIFIC ATLANTA) 18 May 1995 * page 6, line 5 - page 7, line 16 * * page 9, line 16 - page 13, line 28 * * page 19, line 1 - page 20, line 34 * * page 50, line 10 - page 51, line 16 * * figures 1-5 *	1-9 10-17	H04N7/173
X Y	WO-A-95 10918 (IMAGE TELECOMMUNICATIONS CORP) 20 April 1995 * page 2, line 7 - line 14 * * page 15, line 9 - page 18, line 8 * * page 25, line 10 - page 30, line 22 * * page 44, line 13 - page 45, line 19 * * figures 1-8 *	1-8 10-17	
X	EP-A-0 655 865 (MICROSOFT CORP) 31 May 1995 * page 4, column 3, line 37 - page 6, column 8, line 51 * * figures 1-7 *	1-7,9	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H04N
D,X	EP-A-0 594 350 (AMERICAN TELEPHONE & TELEGRAPH) 27 April 1994 * page 3, column 3, line 45 - page 6, column 10, line 6 * * figures 1-5 *	1-9	
X	EP-A-0 431 816 (CABLETIME LTD) 12 June 1991 * page 3, column 3, line 33 - page 4, column 5, line 19 * * figures 2-4 *	1,6,9	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 October 1996	Van der Zaal, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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D : document cited in the application
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